

LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA21 | Drayton Bassett, Hints and Weeford
Operational assessment (SV-004-021)
Sound, noise and vibration

November 2013

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Department
for Transport

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Appendix SV-004-021

Environmental topic:	Sound, noise and vibration	SV
Appendix name:	Operation assessment	004
Community forum area:	Drayton Basset, Hints and Weeford	021

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1 Introduction

1.1 Structure of the sound, noise and vibration appendices

- 1.1.1 The sound, noise and vibration appendices comprise four sections. The first of these details the methodology used (Appendix SV-001-000) and relates to the sound, noise and vibration assessment for all community forum areas (CFA).
- 1.1.2 For the Drayton Basset, Hints and Weeford community forum area (CFA21), the other three sections are as follows:
- baseline sound, noise and vibration (Appendix SV-002-021);
 - construction sound, noise and vibration (Appendix SV-003-021); and
 - operational sound, noise and vibration (Appendix SV-004-021) (this appendix).
- 1.1.3 The outcomes of this assessment are summarised in Volume 2: CFA21 Report, Chapter 11 Sound, Noise and Vibration.
- 1.1.4 Maps referred to throughout the sound, noise and vibration appendices are contained in the Volume 5 sound, noise and vibration map book.
- 1.1.5 This appendix presents the likely noise and vibration impacts, effects and significant effects arising from the operation of the Proposed Scheme for the Drayton Basset, Hints and Weeford area on:
- people, primarily where they live ('residential receptors') in terms a) individual dwellings and b) on a wider community basis, including any shared community spaces; and
 - community facilities such as schools, hospitals, places of worship, and also commercial properties such as offices and hotels, collectively described as 'non-residential receptors' and 'quiet areas'.
- 1.1.6 The assessment of likely impacts, effects and significant effects from operational noise and vibration on agricultural, community, ecological or heritage receptors and the assessment of tranquillity are presented in the following documents within Volume 5:
- Agriculture, forestry and soils Appendix AG-001-021
 - Community Appendix CM-001-021
 - Ecology Appendix EC-005-003
 - Heritage Appendix CH-003-021
 - Landscape and Visual Appendix LV-001-021

1.2 Evaluation of impacts and effects

- 1.2.1 This appendix provides a quantitative assessment of operational noise and vibration impacts and effects and a qualitative assessment of likely significant effects, based on the impacts and effects identified and other local context information consistent with the scope and methodology defined for the Proposed Scheme.
- 1.2.2 Indirect effects arising from permanent changes in traffic patterns on the existing road and rail networks as a consequence of the Proposed Scheme are also reported in this appendix, where they would occur within the study area as defined in Volume 5 Appendix SV-001-000.
- 1.2.3 Route-wide impacts, effects and significant effects associated with noise or vibration from the operation of the Proposed Scheme are reported in Volume 3.
- 1.2.4 Off-route effects of noise or vibration arising from the operation of the Proposed Scheme, including those likely to arise from permanent changes in traffic patterns on roads or railways outside of the study area for direct effects are reported in Volume 4.
- 1.2.5 In undertaking the assessment of sound, noise and vibration, consistent with EIA Regulations and emerging National Planning Practice Guidance¹ a differentiation between impacts effects, adverse effects and significant effects is made. Further information is provided in Volume 5: Appendix SV001-000.
- 1.2.6 The assessment of impacts has been undertaken at assessment locations that are representative of a number of dwellings or other sensitive receptors. The Assessment Locations employed in this assessment are presented on map series Sv-02 in the CFA21 Volume 5 sound, noise and vibration map book.

¹ National Planning Practice Guidance – Noise <http://planningguidance.planningportal.gov.uk> ; refer to the table summarising noise exposure hierarchy

2 Scope, assumptions and limitations

2.1 Regional and local policy guidance

2.1.1 The policy framework for sound, noise and vibration is set out in Volume 1 and in Appendix SV-001-000. As part of the engagement with local authorities through the Planning Forum Sub Group - Acoustics, information regarding any specific local planning guidance in respect of noise and vibration has been requested. Whilst no information has been received for this study area via the Planning Forum Sub Group - Acoustics, the following local policy guidance on noise and vibration has been identified:

- Lichfield District Council – Local Plan – Our Strategy (July 2012)

2.1.2 This guidance has been considered as part of formulating the detailed application of the impact and significance criteria set out in Volume 5, particularly Appendix SV-001-000.

2.2 Engagement

2.2.1 Details of engagement on a route-wide basis with the local and county authorities' Environmental Health Practitioners via the Planning Forum Sub Group - Acoustics, is set out in Volume 1, Volume 8.

2.2.2 Engagement with communities has been via the Community Forums, as set out in Volume 1. In respect of sound, noise and vibration the following discussions have taken place:

- general discussions in respect of local issues, including possible ways to avoid and mitigate the potential impacts of noise or vibration
- September / October 2012; a specific presentation about sound, noise and vibration with discussion afterwards with one of the project team specialists;
- November / December 2012; specific request for the Community Forum to propose baseline sound monitoring locations;
- January / February 2013; feedback to the Community Forum on any proposed baseline monitoring locations; and
- verbal / written response to questions on sound, noise and vibration.

2.3 Methodology

2.3.1 The methodology used for the assessment of airborne sound, ground-borne sound and vibration impacts and the determination of significant effects is defined in the Scope and Methodology Report (SMR) (Volume 5: Appendix CT-001-000/1), is clarified in a number of areas by the SMR addendum (Volume 5: Appendix CT-001-000/2). Further information is contained in Volume 5: Appendix SV-001-000.

2.4 Assumptions

- 2.4.1 Route-wide assumptions are outlined in Volume 1, Section 8, and are further detailed in Volume 5: Appendix SV-001-000. Local assumptions that apply to the assessment of operational sound noise and vibration within this CFA are set out in Volume 2: Report 21.

2.5 Local limitations

- 2.5.1 In this area, there are a number of locations where the land or property owners did not permit baseline sound level monitoring to be undertaken at their premises. However, sufficient information has been obtained to undertake the assessment. Further information is provided in Volume 5: Appendix SV-002-021.

3 Environmental baseline

3.1 Existing baseline

3.1.1 Baseline sound level data has been collected at locations representative of the airborne sound-sensitive receptors. The existing and future baseline airborne sound levels derived from these measurements are included within Table 3. Details of the baseline data collection and the methodology are given in Volume 5: Appendix SV-001-000 and specifically for this study area in Volume 5: Appendix SV-002-021.

3.1.2 The majority of receptors adjacent to the line of the route are not currently subject to appreciable vibration and therefore vibration at all receptors has been assessed using the absolute vibration criteria as described in Volume 5: Appendix SV-001-000.

3.2 Future baseline

3.2.1 The assessment is based upon the predicted change in sound levels that result from the Proposed Scheme. The assessment initially considered a reasonable worst case (that would overestimate the change in levels) by assuming that sound levels would not change from the existing baseline year of 2012/2013. Where significant effects were identified on this basis, the effects have been assessed using the baseline year of 2026 to coincide with the proposed start of passenger services. The future baseline is for the sound environment that would exist in 2026 without the Proposed Scheme.

4 Effects arising during operation

4.1 Introduction

4.1.1 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts and effects are presented. This is followed by the identification of significant effects and the evidence used to support these conclusions.

4.1.2 The structure of this assessment report is:

- Avoidance and mitigation measures
- Quantitative identification of impact and effects
 - Ground-borne sound and vibration
 - Residential
 - Non-residential
 - Airborne sound
 - Residential
 - Non-residential
- Assessment of impacts and effects
 - Residential receptors: direct effects – dwellings
 - Residential receptors: direct effects – communities
 - Residential receptors: indirect effects
 - Non-residential receptors: direct effects
 - Non-residential receptors: indirect effects
 - Cumulative effects from the proposed scheme and other committed development.

4.2 Avoidance and mitigation measures

4.2.1 These are set out in Volume 2: Report 21.

4.3 Quantitative identification of impacts and effects

Ground-borne sound and vibration

4.3.1 Assessment locations defined for the quantitative assessment of impacts are shown on map series SV-02 in the CFA21 Volume 5 sound, noise and vibration map book.

4.3.2 For each Assessment Location, the assessment results for residential and non-residential receptors are presented in Table 1. Explanation of the information in Table 1 is provided in Appendix SV-001-000, with the following additional notes.






B	For non-residential receptors further detail about the type of effect is set out in the text of Volume 5: Appendix SV-001-000.
NA	Type of effect - Generally no adverse effect
A	Type of effect - Adverse effect
S	Type of effect - Significant adverse effect
VDV	Vibration Dose Value
~	The forecast adverse effects are not considered to be significant on a community basis (further information on methodology is provided in Volume 5: Appendix SV-001-000).
^	The impact methodology has identified a potential significant effect at this receptor which based upon further qualitative information is not considered to be a likely significant effect. Please refer the end of this Appendix for further information.
	Where the significant effect column is highlighted in pink, then a significant effect is identified at the referenced residential community area, or individual receptor.
	Yellow denotes a low ground-borne noise impact or a minor ground-borne vibration impact
	Orange denotes a medium ground-borne noise impact or a moderate ground-borne vibration impact
	Red denotes a high ground-borne noise impact or a major ground-borne vibration impact
	Dark red denotes a very high ground-borne noise impact

Table 1: Ground-borne sound and vibration levels, noise and vibration impacts and effects

Assessment location		Impact criteria				Significance criteria								Significant effect
		Ground-borne sound level dB L_{pASmax}	VDV $m/s^{1.75}$ Daytime (07:00 - 23:00)	VDV $m/s^{1.75}$ Night time (23:00 – 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	
ID	Area represented													
26298	The Lodge, Rock Hill	-	0.03	0.02	-	1	NA	R	T	-	-	-	-	
701082	Jerrys Lane, Lichfield	-	0.16	0.08	-	1	NA	R	T	-	-	-	-	
701082	Packington Moor Farm, Jerrys Lane (General Commercial)	-	0.16	0.08	-	1	B	G4/V3	T	-	-	-	-	

Impact summary

- 4.3.3 The operational ground-borne noise and vibration impacts identified in Table 1 are summarised in Table 2.

Table 2: Summary of operational ground-borne noise and vibration impacts

	Number of ground-borne noise impacts			
	Low	Medium	High	Very High
Residential properties	0	0	0	0
Non-residential properties	0			0
	Number of ground-borne vibration impacts			
	Minor	Moderate	Major	Risk of building damage
Residential properties	0	0	0	0
Non-residential properties	0			0

Airborne sound: direct impacts and effects

- 4.3.4 The direct effects from the operation of the Proposed Scheme as well as any new, amended or altered roads or railway lines, which are identified as part of the scheme, are presented in Table 3.
- 4.3.5 The assessment information, impact criteria and significance criteria for the assessment of the incorporated mitigation case at residential and non-residential receptors are presented in Table 3. The results should be considered in conjunction with the information contained in map series Sv-02 in the CFA21 Volume 5 sound, noise and vibration map book.
- 4.3.6 Explanation of the Table 3 information is provided in Volume 5: Appendix SV001-000, with the following additional notes.



Where the significant effect column is marked, then a significant effect is identified at the referenced group of dwellings, or individual residential or non-residential receptor.

Yellow denotes a minor impact at a residential building – a change is of 3-5 dB

Orange denotes a moderate impact at a residential building – a change is of 5-10 dB

Red denotes a major impact at a residential building – a change is of >10 dB

* Day - $L_{pAeq,07:00-23:00}$

** Night - $L_{pAeq,23:00-07:00}$

*** Max - L_{pAFmax} In the Proposed Scheme only column, two values are presented. The first is the value for the HS2 mitigated train and the second is the value for the TSI compliant train. For further information refer to Volume 5: Appendix SV-001-000.

**** Where the Proposed Scheme modifies an existing source, i.e. road or railway realignments, the *Proposed Scheme only* level in the table includes the sound from the modified source. In this situation the *Do something (Opening year baseline + Year 15 traffic)* level has been corrected so as to not double count the sound associated with the road or railway on its new and existing alignment.

A Adverse effect

B For non-residential receptors further detail about the type of effect is set out in the text of Appendix SV-001-000.

CD	Committed Development. The value in brackets in the number of impacts represented column is the value with the committed development.
G	(G1)Theatres, large auditoria and concert halls, (G2) Sound recording and broadcast studios, (G3) Places of meeting for religious worship, courts, cinemas, lecture theatres, museums and small auditoria or halls, (G4) Schools, colleges, hospitals, hotels and libraries, and (G5) Offices and general commercial premises
H	High existing ambient sound level. Defined as $>65\text{dB}_{\text{Aeq, day}}$ and/or $>55\text{dB}_{\text{Aeq, night}}$
L	Low existing ambient sound level. Defined as $<42\text{dB}_{\text{Aeq, day}}$ and/or $<32\text{dB}_{\text{Aeq, night}}$
LD	Landscape receptor
NA	Generally no adverse effect
NI	The receptor is predicted to qualify for mitigation, which shall be provided to the specification defined in the Noise Insulation (Railways and other Guided Rail Systems) Regulations 1996
R	Residential
RM	Residential mooring
S	Significant adverse effect
U	Unacceptable adverse effect
#	A change of 3dB or greater has been identified however, the assessment methodology only defines an impact where the absolute sound level from the Proposed Scheme is greater or equal to 50 dB $L_{\text{pAeq, 23:00} - 07:00}$ during the daytime or 40 dB $L_{\text{pAeq, 07:00} - 23:00}$ at night. At the receptor denoted the absolute level condition is not met and therefore no impact is identified.
~	The forecast adverse effects are not considered to be significant on a community basis (further information on methodology is provided in Volume 5: Appendix SV-001-000)..
\$	A change of 3dB or greater has been identified however, the impact methodology for non-residential receptors includes a screening criteria for G3 building use of 50 dB $L_{\text{pAeq, 07:00} - 23:00}$, for G4 building use 55 dB $L_{\text{pAeq, 07:00} - 23:00}$ and 45 dB $L_{\text{pAeq, 23:00} - 07:00}$, for G5 building use 55 dB $L_{\text{pAeq, 07:00} - 23:00}$. At the receptor denoted the screening criteria is not met and therefore no impact is identified. Further information is provided in Volume 5: Appendix SV-001-000.
^	The impact methodology has either identified an impact at a receptor which based upon further qualitative information does not gives rise to a significant effect. Further information is provided at the end of this Appendix.

Table 3: Operational airborne sound, noise impacts and significant effects

Assessment Location		Impact criteria										Significance criteria								Significant effect
ID	Area represented	Proposed Scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
8926	Hungry Lane, Weeford	40	32	50/53	68	61	78	68	61	0	0	NA	1	R	T	H	-	-	-	
9023	Watling Street, Weeford	55	45	74/77	48	38	38	55	45	7	7	A	3	R	T	-	-	-	-	~
9030	Dog Lane, Weeford	44	37	57/59	49	47	47	49	47	0	0	NA	3	R	T	-	-	-	-	
9371	Dog Lane, Weeford	42	35	59/61	50	48	48	50	48	0	0	NA	5	R	T	-	-	-	-	
9525	Watling Street, Weeford	35	26	50/53	68	61	78	68	61	0	0	NA	1	R	T	H	-	-	-	
9560	Brockhurst Lane, Canwell	39	29	58/60	45	36	43	46	37	1	1	NA	1	R	T	-	-	-	-	
9584	Brockhurst Lane, Canwell	40	30	59/62	45	36	43	46	37	1	1	NA	1	R	T	-	-	-	-	
9603	Brockhurst Lane, Canwell	41	32	61/64	45	36	43	47	37	1	1	NA	2	R	T	-	-	-	-	
9637	Brockhurst Lane, Canwell	43	33	61/64	45	36	43	47	38	2	2	NA	2	R	T	-	-	-	-	
9796	Watling Street, Weeford	53	45	63/66	63	53	53	63	53	0	0	A	1	R	T	-	-	-	-	
10015	Church Hill, Weeford	44	37	50/53	52	50	50	52	50	0	0	NA	13	R	T	-	-	-	-	
10102	Watling Street, Weeford	40	32	51/54	68	61	78	68	61	0	0	NA	2	R	T	H	-	-	-	
10142	Church Hill, Weeford	53	45	53/56	57	55	55	58	55	0	0	A	1	R	T	-	-	-	-	
10165	Flats Lane, Lichfield	56	48	59/62	60	49	65	60	49	0	0	A	2	R	T	-	-	-	-	
10200	Flats Lane, Lichfield	52	44	60/63	57	46	62	58	47	1	1	A	2	R	T	-	-	-	-	
10245	Flats Lane, Lichfield	50	43	59/62	60	49	62	60	49	0	0	A	1	R	T	-	-	-	-	
10260	Flats Lane, Lichfield	56	48	62/65	60	49	62	60	49	0	0	A	2	R	T	-	-	-	-	
10331	Watling Street, Weeford	60	52	63/66	63	55	66	64	56	1	1	A	4	R	T	-	-	-	-	
10348	Watling Street, Weeford	44	37	51/53	68	61	78	68	61	0	0	NA	2	R	T	H	-	-	-	

Assessment Location		Impact criteria										Significance criteria								Significant effect
ID	Area represented	Proposed Scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
10365	Flats Lane, Lichfield	56	49	56/59	66	58	66	66	58	0	0	A	1	R	T	H	-	-	-	
12757	Tamworth Road, Lichfield	45	36	61/64	67	53	73	67	53	0	0	NA	1	R	T	H	-	-	-	
12760	Tamworth Road, Lichfield	37	27	49/52	67	53	73	67	53	0	0	NA	1	R	T	H	-	-	-	
17154	Tamworth Road, Lichfield	51	41	67/70	47	41	48	52	44	5	3	A	1	R	T	-	-	-	-	~
17207	Tamworth Road, Lichfield	57	47	72/75	47	41	48	57	48	10	7	A	1	R	T	-	-	-	-	~
17209	Tamworth Road, Lichfield	46	37	60/63	47	41	48	49	42	2	1	NA	1	R	T	-	-	-	-	
17292	Tamworth Road, Lichfield	52	42	68/71	62	48	68	63	49	0	1	A	1	R	T	-	-	-	-	
17298	Tamworth Road, Lichfield	54	44	70/73	56	51	68	58	52	2	1	A	1	R	T	-	-	-	-	
17311	Tamworth Road, Lichfield	66	58	73/76	66	61	78	67	61	1	0	A	2	R	T	H	-	-	-	^
17316	Tamworth Road, Lichfield	45	36	60/63	46	41	58	48	42	2	1	NA	2	R	T	-	-	-	-	
25308	Hints, Tamworth	47	37	64/67	42	37	46	48	40	6	3	NA	5	R	T	L	-	-	-	#
25326	Brockhurst Lane, Canwell	34	24	51/54	45	36	43	46	36	0	0	NA	1	R	T	-	-	-	-	
25337	Hints, Tamworth	46	36	64/67	42	37	46	47	39	5	3	NA	7	R	T	L	-	-	-	#
25500	Drayton Lane, Drayton Bassett	54	44	70/73	50	48	54	55	49	5	2	A	1	R	T	-	-	-	-	~
25745	Bangley Lane, Hints	47	38	67/70	50	46	53	52	47	2	0	NA	6	R	T	-	-	-	-	
25831	Bangley Lane, Hints	47	37	64/67	50	46	53	52	47	2	0	NA	4	R	T	-	-	-	-	
25881	School Lane, Hints	48	39	66/68	45	40	52	50	42	4	2	NA	2	R	T	-	-	-	-	#
26030	Hints, Tamworth	44	35	61/65	49	42	50	50	43	1	1	NA	5	R	T	-	-	-	-	
26131	School Lane, Hints	44	35	60/63	49	42	50	50	43	1	1	NA	3	R	T	-	-	-	-	
26158	School Lane, Hints	47	38	65/67	49	39	42	51	41	2	2	NA	1	R	T	-	-	-	-	

Assessment Location		Impact criteria										Significance criteria								Significant effect
ID	Area represented	Proposed Scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
26177	School Lane, Hints	45	36	63/65	51	41	46	51	42	1	1	NA	4	R	T	-	-	-	-	
26242	Watling Street, Hints	41	32	57/60	62	41	48	62	42	0	0	NA	8	R	T	-	-	-	-	
26269	Watling Street, Hints	44	34	59/62	62	41	48	62	42	0	1	NA	7	R	T	-	-	-	-	
26298	Watling Street, Weeford	58	50	75/77	62	54	64	63	54	1	0	A	1	R	T	-	-	-	-	
26322	School Lane, Hints	43	34	59/62	62	41	48	62	42	0	1	NA	2	R	T	-	-	-	-	
26447	Watling Street, Weeford	50	42	56/59	56	48	56	56	48	0	0	A	1	R	T	-	-	-	-	
26463	Carroway Head, Bangley	43	34	55/58	64	57	71	64	57	0	0	NA	1	R	T	H	-	-	-	
26552	Sutton Road, Drayton Bassett	61	52	63/66	57	50	67	61	52	4	3	A	1	R	T	-	-	-	-	~
26582	Bangley Lane, Hints	50	41	67/70	50	46	53	53	47	3	1	A	1	R	T	-	-	-	-	~
26608	Bangley Lane, Hints	49	39	65/68	44	40	52	50	42	6	2	NA	4	R	T	-	-	-	-	#
26657	Bangley Lane, Hints	43	34	57/60	45	41	54	46	42	2	1	NA	2	R	T	-	-	-	-	
26678	Bangley Lane, Hints	48	39	66/68	45	41	54	49	43	5	2	NA	2	R	T	-	-	-	-	#
26713	Waggoner's Lane, Drayton Bassett	51	41	66/69	42	38	54	51	43	9	5	A	1	R	T	L	-	-	-	~
26826	Bangley Lane, Hints	43	34	57/60	46	42	56	47	42	1	0	NA	1	R	T	-	-	-	-	
26913	School Lane, Hints	42	33	58/62	49	42	50	49	43	1	0	NA	2	R	T	-	-	-	-	
27194	Watling Street, Hints	40	31	57/60	62	41	48	62	42	0	0	NA	19	R	T	-	-	-	-	
27298	Drayton Lane, Drayton Bassett	55	46	69/72	47	45	54	55	48	8	3	A	1	R	T	-	-	-	-	~
27402	Drayton Lane, Drayton Bassett	51	42	68/71	50	48	54	54	48	3	1	A	5	R	T	-	-	-	-	~
27539	Sutton Road, Tamworth	43	36	52/54	47	40	51	47	40	1	0	NA	2	R	T	-	-	-	-	
27560	Sutton Road, Tamworth	45	37	58/60	62	55	66	62	55	0	0	NA	1	R	T	H	-	-	-	

Assessment Location		Impact criteria										Significance criteria								Significant effect
ID	Area represented	Proposed Scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
27593	Sutton Road, Tamworth	40	31	55/58	67	60	71	67	60	0	0	NA	1	R	T	H	-	-	-	
27614	Sutton Road, Tamworth	39	29	53/56	57	50	61	57	50	0	0	NA	6	R	T	-	-	-	-	
28047	School Lane, Hints	43	34	60/63	49	39	46	50	40	1	1	NA	7	R	T	-	-	-	-	
28076	School Lane, Hints	46	37	64/67	45	40	52	49	41	3	2	NA	5	R	T	-	-	-	-	#
28361	Tamworth Road, Lichfield	43	34	65/68	72	67	84	72	67	0	0	NA	2	R	T	H	-	-	-	
28834	Jerrys Lane, Lichfield	48	39	68/71	51	50	63	53	50	2	0	NA	1	R	T	-	-	-	-	
28865	Levett Road, Lichfield	43	33	64/67	50	34	50	51	36	1	3	NA	8	R	T	-	-	-	-	#
28886	Levett Road, Lichfield	42	33	63/66	50	34	50	51	36	1	2	NA	8	R	T	-	-	-	-	
28935	Levett Road, Lichfield	42	33	62/65	56	40	56	56	40	0	1	NA	14	R	T	-	-	-	-	
28998	Tamworth Road, Lichfield	41	32	61/64	69	53	66	69	53	0	0	NA	4	R	T	H	-	-	-	
154363	Portleys Lane, Drayton Bassett	41	32	56/59	53	42	59	54	42	0	0	NA	7	R	T	-	-	-	-	
155677	Shirrall Drive, Drayton Bassett	48	39	62/65	50	49	50	51	49	2	0	NA	11	R	T	-	-	-	-	
157835	Portleys Lane, Drayton Bassett	43	34	58/61	56	45	62	56	45	0	0	NA	1	R	T	-	-	-	-	
701082	Jerrys Lane, Lichfield	71	62	89/92	39	38	52	71	62	32	24	S	1	R	T	L	-	-	NI	OSV21-D01
711040	Waggoners Lane, Hints	73	64	90/93	45	41	54	73	64	28	23	U	1	R	T	-	-	-	NI	OSV21-D02
901037	Snakes Hill	58	48	75/78	48	38	38	58	48	10	10	-	-	LD	-	-	-	-	-	
901038	Heart Of England Way	53	43	71/74	50	40	40	55	45	5	5	-	-	LD	-	-	-	-	-	
901040	Rookery	57	47	75/77	45	36	43	57	48	12	11	-	-	LD	-	-	-	-	-	
901041	Round Hill Wood	52	42	67/70	45	36	43	52	43	7	7	-	-	LD	-	-	-	-	-	
8910	Old School House Restaurant, Church Hill, Weeford	43	36	50/53	52	50	50	52	50	0	0	B	1	G5	T	-	-	-	-	

Assessment Location		Impact criteria										Significance criteria								Significant effect
ID	Area represented	Proposed Scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
	(Restaurant)																			
8926	Meadow Fields, Hungry Lane, Weeford (General Commercial)	40	32	50/53	68	61	78	68	61	0	0	B	2	G5	T	H	-	-	-	
9637	Brockhurst Lane, Canwell, (General Commercial)	43	33	61/64	45	36	43	47	38	2	2	B	1	G5	T	-	-	-	-	
10142	Village Hall, Weeford Road, Weeford (Hall)	53	45	53/56	57	55	55	58	55	0	0	B	1	G3	T	-	-	-	-	
25881	St Bartholomew's Church, Hints (Church)	48	39	66/68	45	40	52	50	42	4	2	B	1	G3	T	-	-	-	-	\$
26158	Hints Village Hall, Hints (Hall)	47	38	65/67	49	39	42	51	41	2	2	B	1	G3	T	-	-	-	-	
26177	Manor Farm, School Lane, Hints (Office)	45	36	63/65	51	41	46	51	42	1	1	B	1	G5	T	-	-	-	-	
27402	Little Acorns Day Nursery, Oak Farm (Nursery)	51	42	68/71	50	48	54	54	48	3	1	B	1	G4	T	-	-	-	-	\$
27539	Sutton Road, Tamworth (General Commercial)	43	36	52/54	47	40	51	47	40	1	0	B	1	G5	T	-	-	-	-	
700646	St. Mary's Church, Weeford (Church)	43	36	49/52	52	50	50	52	50	0	0	B	1	G3	T	-	-	-	-	
701082	Packington Moor Farm, Jerrys Lane (General Commercial)	71	62	89/92	39	38	52	71	62	32	24	B	1	G5	T	L	-	-	-	OSV21-No1

Direct impact - Summary

4.3.7 The operational airborne noise impacts identified in Table 3 are summarised in Table 4.

Table 4: Summary of operational airborne sound impacts

Receptor	Number of impacts		
	Minor	Moderate	Major
Residential properties	7	7	3
Non-residential properties	0	0	1
Quiet areas	None	None	None

4.4 Assessment of impacts and effects

Residential receptors: direct effects - individual buildings

- 4.4.2 Taking account of the avoidance and mitigation measures incorporated into the Proposed Scheme, the assessment has identified two residential buildings, Packington Moor Farm, Jerry's Lane, Lichfield, represented by receptor 701082 (marked as OSV21-Do1 in Table 3) and The Mill House, at White House Farm, Hints, represented by receptor 711040 (marked as OSV21-Do2 in Table 3) close to the Proposed Scheme, where noise would exceed the daytime trigger threshold set in the Regulations. It is therefore estimated that this building is likely to qualify for noise insulation under the Regulations. It is indicated on Volume 5: Map Book - Sound, noise and vibration, Map series SV-02.
- 4.4.3 The mitigation measures including noise insulation will reduce noise inside all dwellings such that it will not reach a level where it would significantly affect residents.
- 4.4.4 In this area the assessment has identified one residential building, represented by receptor 17311, close to the Proposed Scheme, where noise would exceed the daytime trigger threshold set in the Regulations. Furthermore the forecast night-time noise level would exceed the World Health Organization's Interim Target of 55dB²Error! Bookmark not defined. However, the overall sound levels at this receptor are increased by less than 1dB during the day and 0dB at night as a result of the Proposed Scheme and therefore mitigation will not be provided to this receptor.

Residential receptors: direct effects –communities

- 4.4.5 The mitigation measures in this area will avoid airborne noise adverse effects on the majority of receptors, and at the following residential communities:
- Drayton Bassett
 - Hints; and

² World Health Organization, Night-time Noise Guidelines for Europe, 2010

- Weeford.

- 4.4.6 Taking account of the envisaged mitigation, Map Series SV-02 (Volume 5 Map book) shows the long term 40dB³ night-time sound level contour from the operation of trains on the Proposed Scheme. The extent of the 40dB night-time sound level contour is equivalent to, or slightly larger than, the 50dB daytime contour⁴. In general, below these levels adverse effects are not expected.
- 4.4.7 Above 40dB during the night and 50dB during the day the effect of noise is dependent on the baseline sound levels in that area and the change in sound level (magnitude of effect) brought about by the Proposed Scheme. The airborne noise impacts and effects forecast for the operation of the scheme are presented on Map Series SV-02 (Volume 5 Map Book).
- 4.4.8 Approximately 15 isolated properties within the area have been identified as being subject to an observed adverse noise effect; these effects are likely to be considered as an effect on the acoustic character of the area such that there is a perceived change in the quality of life. However, as the affected properties are spatially remote from larger defined residential areas, are subject to smaller magnitudes of noise effect, or are small in number, the effects are not considered to be significant.
- 4.4.9 The changes in noise levels are likely to affect the acoustic character of the area such that there is a perceived change in the quality of life and are considered to be significant when assessed on a community basis taking account of the local context. When considered on this basis, none of the adverse effects in this area are considered to be significant.

Residential receptors: indirect effects

- 4.4.10 The transport assessment presented in Volume 5: Appendix TR-001-000, has been used to identify those roads or railways within this study area where the alignment remains as at present, but a change in flow or composition is identified which is greater than the screening criteria defined in Volume 5: Appendix SV-001-000. No roads or railways which exceed the criteria defined in Volume 5: Appendix SV-001-000 have been identified in this study area.
- 4.4.11 The assessment of operational noise and vibration indicates that significant indirect effects on residential receptors are unlikely to occur in this area.

Non-residential receptors: direct effects

- 4.4.12 The assessment has identified airborne noise impacts at Packington Moor Farm represented by receptor reference 701082.

³ Defined as the equivalent continuous sound level from 23:00 to 07:00 or $L_{pAeq,night}$

⁴ With the train flows described in the assumptions section of this CFA Report, the daytime sound level (defined as the equivalent continuous sound level from 07:00 to 23:00 or $L_{pAeq,day}$) from the Proposed Scheme would be approximately 10dB higher than the night-time sound level. The 40dB contour therefore indicates the distance from the Proposed Scheme at which the daytime sound level would be 50dB.

Packington Moor Farm

- 4.4.13 A major operational noise impact has been identified based upon the change in the airborne noise level outside this receptor, reference 701082. An assessment has been undertaken to determine if this impact would result in a likely significant effect at this non-residential receptor, using the significance criteria detailed in Volume 5: Appendix 001-000.
- 4.4.14 At Packington Moor Farm the majority of the farm buildings are demolished as part of the Proposed Scheme, including the current Oak Barn used to conduct wedding services, however, the holiday cottages remain and are subject to this assessment. The residences are considered within the residential assessment. The buildings at Packington Moor Farm are one or two storey brick constructions with tiled roofs and single glazed windows, which it is assumed are opened to provide ventilation.
- 4.4.15 Packington Moor Farm is identified, on a precautionary basis, as being subject to a significant adverse effect denoted by OSV21-No1 in Table 3 and drawing SV-02 (see CFA21 Volume 5 sound, noise and vibration map book). This may take the form of the activity disturbance to the people using the buildings.

Summary

- 4.4.16 The assessment of operational noise and vibration indicates that significant effects are likely on the non-residential receptors identified in
- 4.4.17 Table 5.
- 4.4.18 The assessment of effects on non-residential receptors has been undertaken on a worst case basis taking account of public available information about each receptor.

Table 5: Likely significant noise or vibration effects on non-residential receptors arising from operation of the Proposed Scheme

Significant effect number (see Map series SV-02 Table 1 and 3)	Type of significant effect and source	Time of day	Location and details
OSV21-No1	Major adverse noise effect on the acoustic character outside the buildings and on a worst case basis there is a risk of disturbing activities inside the buildings due to the operation of train services.	Daytime/night-time	Holiday accommodation (if the business is continued) at Packington Moor Farm, Jerry's Lane, Lichfield.

Non-residential receptors: indirect effects

- 4.4.19 The transport assessment presented in Volume 5: Appendix TR-001-000, has been used to identify those roads or railways within this study area where the alignment remains as at present, but a change in flow or composition is identified which is greater than the screening criteria defined in Volume 5: Appendix SV-001-000. No roads or railways which exceed the criteria defined in Volume 5: Appendix SV-001-000 have been identified in this study area.

- 4.4.20 The assessment of operational noise and vibration indicates that significant indirect effects are unlikely to occur on non-residential receptors in this area.

Cumulative effects

- 4.4.21 Details of properties being currently developed which were afforded planning approval before the safeguarding date are presented in Volume 5: Appendix CToo4-000. Within this area, the operational sound, noise or vibration associated with these developments in conjunction with the operation of the Proposed Scheme do not result in any significant cumulative effects.